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Circadian Variations of Ventricular Arrhythmias and Sleep-Disordered Breathing in HF Patients

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We read with interest the study by Patton et al. (1) on the unexpected absence of typical circadian variation of ventricular arrhythmias observed in the SCD-HeFT (Sudden Cardiac Death in Heart Failure Trial). Sleep-disordered breathing (SDB), broadly categorized into obstructive and central sleep apnea, has been associated with increased cardiovascular morbidity and mortality. Cardiac arrhythmias are responsible for some of the higher cardiovascular morbidity and mortality rates observed in patients with SDB. The association between atrial fibrillation and SDB is well established, although the association between SDB and life-threatening ventricular arrhythmias also seems plausible. Obstructive sleep apnea predicts sudden cardiac death independently of other well-established risk factors (2), and, unlike the general population, patients with SDB have a higher incidence of sudden cardiac death during sleep (3). Studies consistently report an SDB prevalence of ≥50% in the chronic heart failure population. The prevalence of SDB in patients with an implantable cardioverter-defibrillator (ICD) ranges between 57.8% and 66.3% (4,5). In a cohort of 472 ICD patients with heart failure receiving cardiac resynchronization therapy, a significant risk enhancement of ventricular arrhythmias and appropriate ICD therapies owing to both central and obstructive sleep apnea was found (5). Importantly, for heart failure patients with a primary inappropriate ICD therapies (4). Patton et al. (1) observed an increase in the onset of ventricular arrhythmias during sleep in patients with an ICD and SDB. Data on SDB for patients enrolled in the SCD-HeFT were not reported. Thus, it is our opinion that the observed deviation in circadian variation of ventricular arrhythmias reported by Patton et al. (1) may be influenced, at least in part by the presence of SDB, a very prevalent condition among heart failure patients with an ICD.

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REPLY: Circadian Variations of Ventricular Arrhythmias and Sleep-Disordered Breathing in HF Patients

We appreciate the interest of Dr. Arias and colleagues in our study of circadian and septadian patterns of implantable cardioverter-defibrillator therapy in the SCD-HeFT (Sudden Cardiac Death in Heart Failure Trial) population (1). In their Letter, they relevantly highlight the importance of sleep-disordered breathing as a trigger of ventricular arrhythmias and implantable cardioverter-defibrillator therapies. Both central and obstructive sleep apnea exert strong effects on the autonomic nervous system and are known to be proarrhythmic (2).

We agree with Dr. Arias and colleagues that sleep-disordered breathing is an important and increasingly recognized trigger of arrhythmias (3). Unfortunately, we do not have information on the presence